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Office of Nuclear Physics

Exploring Nuclear Matter - Quarks to Stars

RHIC/AGS Users Meeting

Gulshan Rai
Program Manager
for Heavy Ion Nuclear Physics
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- Program
- Budget & Funding
- Investments
- Strategy
- Closing Remarks

Heavy Ion Program

Supports research directed at answering one of central questions of modern nuclear physics:

What are the properties of hot nuclear matter?

Heavy Ion Subprogram funds:

- University & Laboratory fundamental research & detector R&D
- Operations of RHIC (Heavy Ions & Protons) and advanced accelerator R&D
- Experimental support at RHIC
- Training of the next generation of scientists needed to support both the mission of the DOE and the Nation.

Program by Funding

(Dollars in Millions)					
	FY 2005	FY 2006	Change 05 to 06	FY 2007 Request	Change 06 to 07
University Grants	12.8	12.0	-6.3%	14.0	16.7%
National Laboratories	9.3	8.4	-9.7%	10.7	27.4%
Research Total	22.1	20.4	-7.7%	24.7	21.1%
RHIC Research	6.4	6.5	1.2%	6.8	4.7%
RHIC Operations	121.5	111.1	-8.6%	137.7	23.9%
RHIC Program Total	127.9	117.6	-8.1%	144.5	22.9%
Heavy Ion Total	150.0	138.0	-8.0%	169.2	22.6%

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University Program by Experiments

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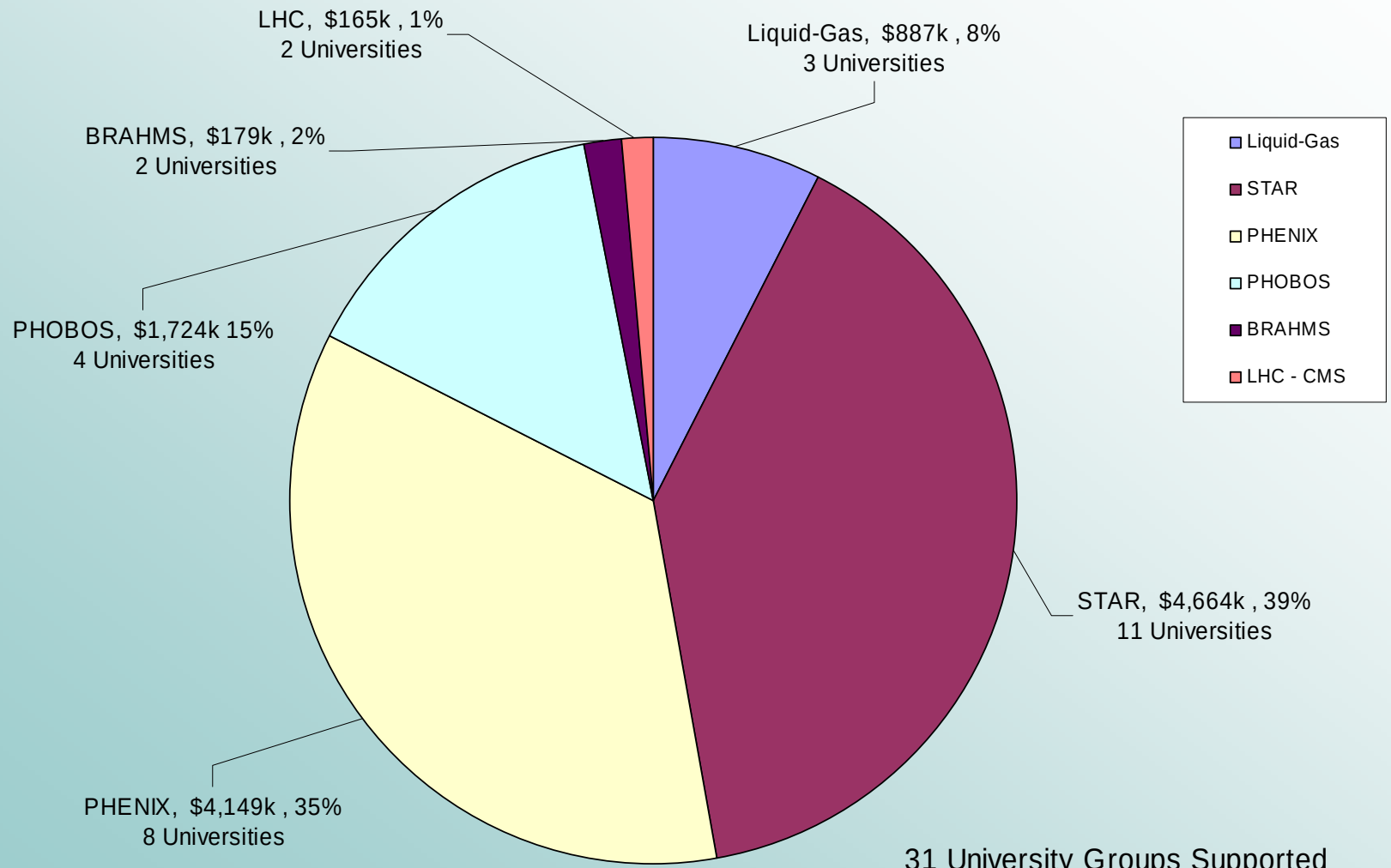
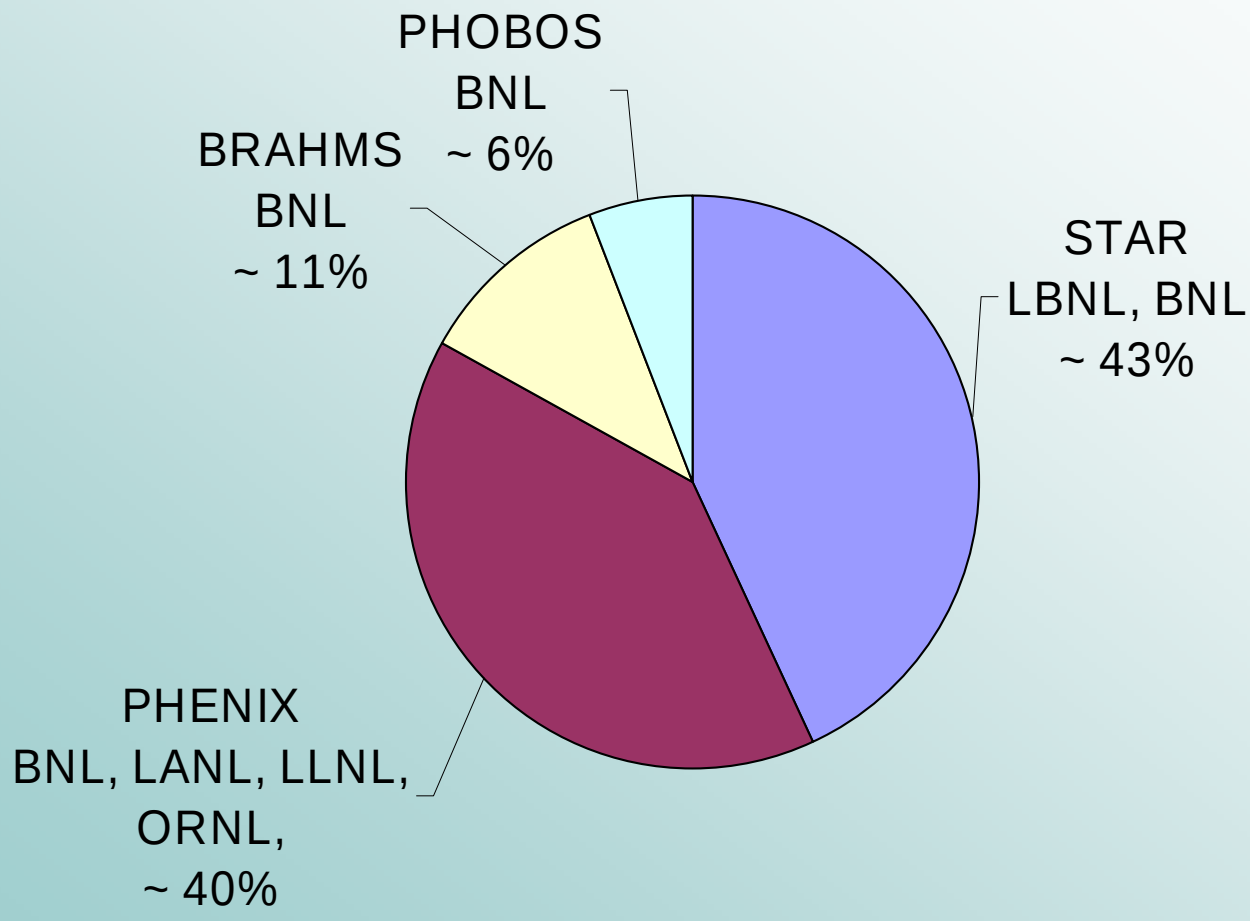


31 University Groups Supported

3 Outstanding Junior Investigator Awards

2 EPSCoR Awards

Laboratory Program by Experiments



FY 2007 Program Budget

A little above inflation cf. FY 2005

Allows full operation of RHIC

Allows some investments for the near future.

Responsive to the 2004 NSAC Subcommittee:
Review of Heavy-Ion Nuclear Physics

Investments for the Mid-Term

Full exploitation of the existing RHIC facility combined with investment in future research tools.

- Construction of the PHENIX Silicon Vertex Tracker (VTX) and the STAR Time-of-Flight (TOF) Barrel.
  - TOF MIE construction started in FY2006 (TEC~ $4.8M)
  - VTX Project reviewed by DOE NP, FY2007 MIE Request (TEC~$4.5M)
- Construction of the Electron Beam Ion Source (EBIS)
  - CD-0 Approved August 2004; CD-1 Approved September 2005; External Independent Review planned this summer; CD-2 4QO6 (TPC~$12-15M)
- Investment in RHIC accelerator and detector R&D;
  - R&D sustained ~ $2.0M in electron cooling and $1.5M in Detectors

Investments for the Mid-Term…

- Participation in the LHC Heavy-Ion program
  - Mission Need CD-0 approved November 2005
  - Support a modest effort. FY2007 requests $1.0M
- Provision for RHIC running time sufficient to preserve the integrity of the Heavy-Ion and Spin Physics programs
  - Dedicated Proton Run in FY 2006 possible with benefactor support
  - RHIC supported for ~34-week schedule in FY2007 request
  - In light of rising energy costs, DOE NP will conduct an efficiency operations review before the end of the year.
- Support at the present level for university and national laboratory research
  - FY 2006 is difficult year. Focus on opportunities. 2 grants phasing out; targeted research declines at laboratories.
  - Good News: 3 new tenure-track Assistant Professor positions supported (all women)

BNL Mid-Term Strategic Plan: 2006-2011

Additional detector upgrades at RHIC for both Heavy Ion Physics and RHIC spin

- Heavy Flavor Tracker (STAR)
- Inner/Forward Tracker (STAR)
- Forward Vertex Detector (PHENIX)
- Nose Cone Calorimeter (PHENIX)

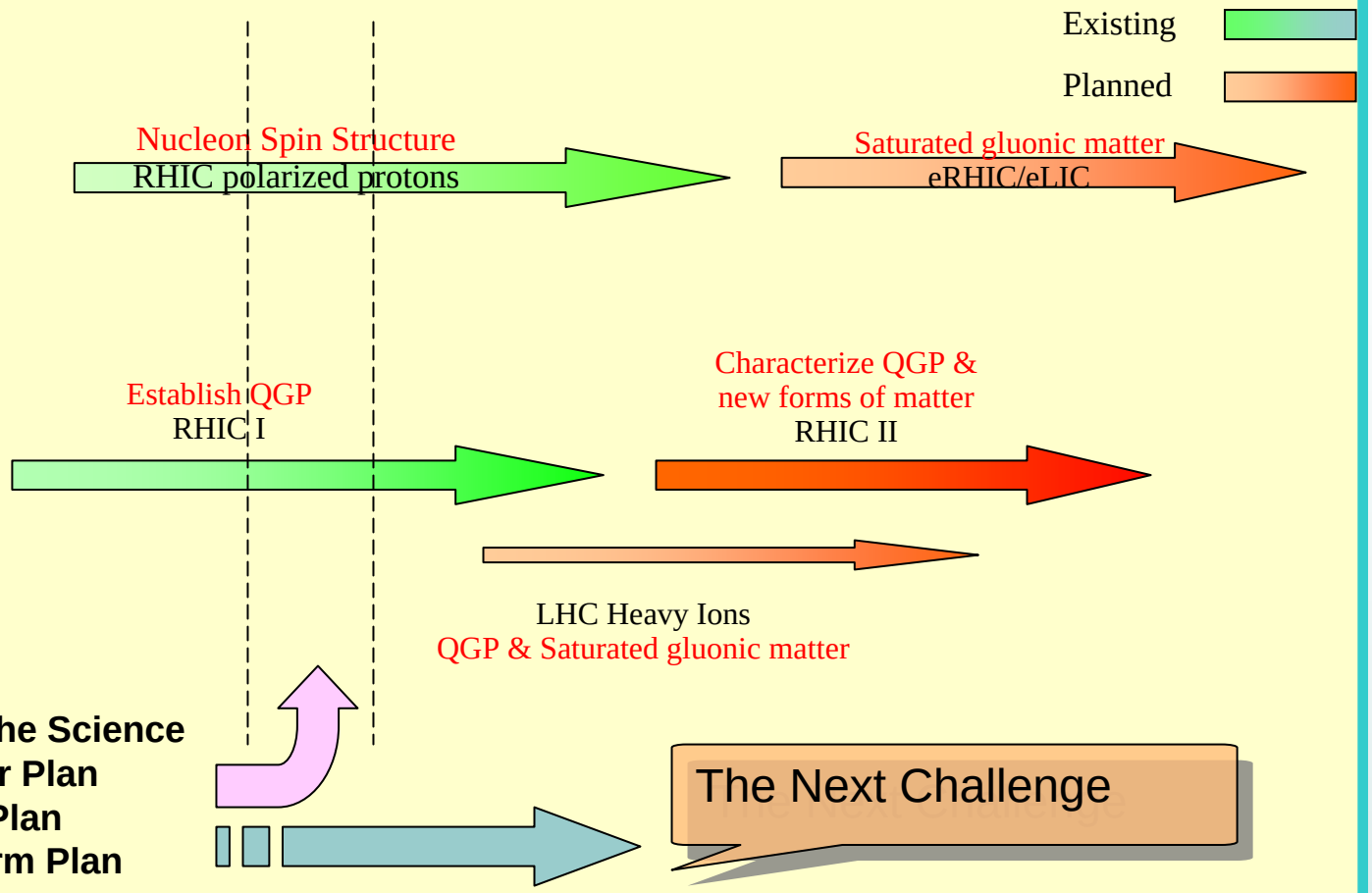
These projects are under development or review. Require substantial funding.

No MIE funding in FY2007. Earliest project construction start 2008 assuming appropriations. DOE will be starting FY2009 the budget formulation in 6-7 months.

Strategic Plan

Quark Structure
Establish a QCD description of nucleon structure and understanding of quark "confinement"

Hot Nuclear Matter
Understand properties of hot, dense nuclear matter and "states" of nuclear matter



Beyond the Mid-Term – New Horizon

The Challenge:

A case to exploit great opportunities to achieve extraordinary results must be made for large federal investments

Resources are going to be competitive across the scientific fields and federal programs

- Next Nuclear Physics Long Range Plan – Set Priorities
- Engage the public, explain the benefits, inform the policy makers

American Competitiveness Initiative (ACI)

In 2006 Presidential State of the Union Address, The President announced the ACI to build on our Nations' successes and remain a leader in science and technology

Doubles, over 10 years, funding for innovation-enabling research at key Federal agencies that support high-leverage fields of physical science and engineering: the National Science Foundation, the Department of Energy's Office of Science, and the National Institute for Standards and Technology within the Department of Commerce

Emphasizes fields likely to be economically important technologies in the future

ACI doubles total research fund; individual agency allocations remain to be determined.

Very good for science…